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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,940	03/19/2004	Yoshinobu Takeyama	250250US2	7177

22850 7590 05/06/2008

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1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

LIU, KENDRICK X

ART UNIT

PAPER NUMBER

4193

NOTIFICATION DATE

DELIVERY MODE

05/06/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/803,940

Applicant(s)

TAKEYAMA ET AL.

Examiner

KENDRICK X. LIU

Art Unit

4193

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 31 and 38 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 20 and 21 is/are rejected.
- 7) ☒ Claim(s) 1-30 and 32-37 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
- Paper No(s)/Mail Date 3/19/04, 9/16/05, 5/15/06
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the **abstract not exceed 150 words** in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phrasing often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The abstract of the disclosure is objected to because the abstract in the instant application exceeds the maximum 150-word limit. Correction is required. See MPEP § 608.01(b).

Claim Objections

3. **Claims 1-30 and 32-37** are objected to because of the following informalities:

Regarding **claim 1**, in the recitation of "a plurality of visible image forming units each including development means for developing latent images on **said latent image bearing member**" on lines 3-5, it is unclear which one of the plurality of latent image bearing members is being referred to. The examiner recommends using such language as --a plurality of visible image forming units each including development means for developing latent images on said corresponding latent image bearing member--.

Regarding **claim 1**, the recitation of "mark **detecting** signal" on line 19-20 is inconsistent with subsequent recitations of the same limitation. The examiner recommends changing the language to --mark detection signal--.

Regarding **claim 1**, the recitations of **“light”** on line 21 and line 30 refer to a previous recitation on lines 8-9. As such, the definite article --the-- or --said-- should be used.

Regarding **claims 1 and 20**, the recitations of “surface” on line 38 and line 28 of the respective claims refer to previous recitations on line 18 and line 11, respectively. As such, the definite article --the-- or --said-- should be used.

Regarding **claim 1**, the recitation of **“surface thereof”** on line 38 is unclear as to the surface of the transfer member or the means for rotating. The examiner recommends using such language as --surface of said endless intermediate transfer member thereof--.

Regarding **claim 1**, the recitation of **“plural visible images each provided by a same of said visible image forming units”** on lines 38-40 is unclear. The examiner believes the applicant intends to recite --plural visible images each provided by a same of said visible image forming units for one of rounds of rotation of the endless intermediate transfer member--.

Regarding **claims 2 and 21**, the recitations of **“plurality of visible image forming units each includes”** on lines 3-4 and **“means for forming visible images includes”** on line 3 in the respective claims describe further including elements in the limitations. As such, the applicant should change the language to reflect --further includes--.

Regarding **claim 2**, the recitation of **“first and second image forming units”** on line 4 is inconsistent with other recitations of the same limitations. As such, applicant should change the language of the recitation to such as --first and second visible image forming units--.

Regarding **claims 2-11, 13-18, 22-30 and 32-37**, the recitations of **“light scanning means is configured”** describe further configuring of the light scanning means. As such,

applicant should change the language of the recitation to, for example, --light scanning means is further configured--.

Regarding **claims 2 and 21**, the recitations of **“mark detection signal”** on lines 17-18 and line 18 in the respective claims refer to previous recitations on lines 19-20 in claim 1 and line 19 in claim 20, respectively. As such, the definite article --the-- should be used.

Regarding **claims 2 and 21**, the recitations of **“a first rotation”** on line 19 and lines 19-20 in the respective claims and of **“a second rotation”** on lines 23-24 in both claims are unclear. The examiner believes the applicant intends to recite --the first round of rotation-- and --the second round of rotation-- , respectively.

Regarding **claims 3, 4, 5, 7, 9, 14, 16, 22, 23, 24, 26, 28, 33 and 35**, the recitations of **“first round of rotation”** on lines 5, 10, 13, 6, 8-9, 6-7, 8-9, 6, 10, 14, 6-7, 8-9, 7-8 and 8-9, respectively, refer to previous recitations on lines 9-10 in claim 2 for claims 3, 4, 5, 7, 9, 14 and 16 and line 9 in claim 21 for claims 22, 23, 24, 26, 28, 33 and 35. As such, the definite article --the-- should be used.

Regarding **claims 3, 5, 8, 10, 15, 17, 22, 24, 27, 29, 34 and 36**, the recitations of **“second round of rotation”** on lines 14-5, 5-6, 2-3, 2-3, 2-3, 2-3, 15-16, 6-7, 2-3, 2-3, 2-3 and 2-3 refer to previous recitations on line 14 in claim 2 for claims 3, 5, 8, 10, 15 and 17 and lines 13-14 in claim 21 for claims 22, 24, 27, 29, 34 and 36. As such, the definite article --the-- should be used.

Regarding **claims 3 and 22**, the recitations of **“said base correction time t1”** on lines 9-10 and 10-11 in the respective claims lack antecedent basis. As such, the indefinite article --a-- should be used.

Regarding **claims 3, 5, 22 and 24**, the recitations of “**time Tc**” on line 11 in claim 3 and line 12 in claim 22 and “**Tc**” on line 10 in claim 5 and line 11 in claim 24 refer to previous recitations on lines 21-22 in claim 2 for claims 3 and 5 and lines 21-22 in claim 21 for claims 22 and 24. As such, the definite article --the-- or --said-- should be used.

Regarding **claims 5 and 24**, the recitations of “predetermined time **in comparison with said base correction time t1** based ... said base correction time t1” on lines 11-17 and lines 12-18 in the respective claims are redundant and unclear. The applicant should change the language to such as --predetermined time based ... said base correction time t1--.

Regarding **claims 7, 14, 26 and 33**, the recitations of “**said mark detection signals**” on lines 10, 10, 10 and 11 in the respective claims lack antecedent basis.

Regarding **claims 11 and 18**, the recitations of “**said image information**” on line 2 in both claims lack antecedent basis.

Regarding **claims 12 and 19**, the recitations of “image forming apparatus ... further comprising: **a plurality of development means**” on lines 1-3 in both claims are unclear since development means have previously been included as recited on lines 3-4 in claim 1.

Regarding **claims 13 and 32**, the recitations of “**added correction time t1**” on line 6 and line 7 in the respective claims define a name for t1' differently from the recitation of “predetermined base correction time t1” on line 4 in claim 3 and line 5 in claim 22. The applicant should define one name for each reference symbol to avoid confusion.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. **Claims 1 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Takeyama et al. (US Patent 6,263,178 B1)** in view of **Takeuchi (US Patent 6,075,547)** and **Saitoh et al. (US Publication 2002/0037178 A1)**.

Regarding **claim 1**, Takeyama '178 teaches an "image forming apparatus" (color image forming apparatus, FIG. 1), comprising:

- a "plurality of latent image bearing members" (photoconductive drums 16 and 26, FIG. 1, column 4 lines 34-60);
- a "plurality of visible image forming units each including development means for developing latent images on said [corresponding] latent image bearing member to form visible images

- thereon” (first and second image forming unit I and II; first image forming unit I including developing sections 100 and 200, FIG. 1, column 2 lines 38-39 lines 50-56);
- an “endless intermediate transfer member” (intermediate image transfer belt 10, FIG. 1, column 2 lines 35-49);
 - “means for rotating said endless intermediate transfer member” (drive roller 12 and driven roller 13, FIG. 1, column 2 lines 35-49);
 - a “transfer means for transferring said visible images formed by said visible image forming units in a manner to be superposed on said endless intermediate transfer member” (intermediate image transfer belt 10, drive roller 12, driven roller 13, first image transfer roller 41, second image transfer roller 42 and cleaning unit 61, FIG. 1, column 3 line 64 to column 4 line 16);
 - a “mark detection means for detecting a base mark affixed onto a predetermined location on a surface of said endless intermediate transfer member and providing a mark ... [detection] signal” (sensor 8 senses mark 7 providing output to CPU 1, FIGs. 3 and 4, column 5 lines 36-46); wherein
 - said endless intermediate transfer member is “adapted to be rotated for a plurality of rounds by said means for rotating such that ... [the] surface [of said endless intermediate transfer member] thereof is superposed thereon with plural visible images each provided by a same of said visible image forming units [for one of multiple rounds of rotation of the endless intermediate transfer member] during each round of rotation” (first and second writing steps performed within each period of mark detection signal, FIG. 5, column 6 line 36 to column 8 line 3).

Takeyama '178 fails to teach:

- a “standard angle detection means for detecting [the] light deflected by said deflecting means arriving at a predetermined angle of deflection”; and
- a “light scanning means for forming said latent images on said latent image bearing members, said scanning means including a deflecting means for deflecting image information light to form said latent images on surfaces of said latent image bearing members,” wherein said light scanning means is configured to carry out “light scanning onto said plurality of latent image bearing members such that at least one pair of neighboring visible image forming units of said plurality of visible image forming units are both subjected to light scanning by a same deflecting means.”

However, Takeuchi teaches:

- a “standard angle detection means for detecting ... light deflected by ... deflecting means arriving at a predetermined angle of deflection” (line sync detecting sensor 5F; angle of deflection determined by location of detector, FIG. 3, column 8 lines 31-50; standard angle detection means is used interchangeably as beam detection means as disclosed in paragraph [0118] and FIG. 3 of the current application); and

Saitoh et al. teach:

- a “light scanning means for forming ... latent images on ... latent image bearing members, said scanning means including a deflecting means for deflecting image information light to form said latent images on surfaces of said latent image bearing members,” wherein said light scanning means is configured to carry out “light scanning onto said plurality of latent image bearing members such that at least one pair of neighboring visible image forming units

of said plurality of visible image forming units are both subjected to light scanning by a same deflecting means” (optical writing unit 180 including polygonal mirrors 180a exposes drums 160 and 260, FIG. 24, paragraph [0184]-[0186]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Takeyama ‘178 by using the standard angle detection means for the benefit of synchronizing scan start timing as taught by Takeuchi (column 8 lines 31-50) and by using the light scanning means with two image stations for the benefit of reducing cost as taught by Saitoh et al. (paragraphs [0009]-[0010]).

Regarding **claim 20**, Takeyama ‘178, Takeuchi and Saitoh et al. teach all the limitations of this claim similar to the limitations discussed in claim 1 above.

7. **Claims 2 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Takeyama et al. (US Patent 6,263,178 B1)** in view of **Takeuchi (US Patent 6,075,547)** and **Saitoh et al. (US Publication 2002/0037178 A1)** and further in view of **Takeyama et al. (US Patent 6,222,566 B1)**.

Regarding **claim 2**, the combination of Takeyama ‘178, Takeuchi and Saitoh et al. teaches the limitations of this claim as discussed in claim 1 above but fails to teach said light scanning means is [further] configured, after “storing a time lag Δt as a difference between a time T_a when ... [the] mark detection signal is detected and a time T_b when said standard angle detection signal is detected during ... [the] first [round of] rotation of said endless intermediate transfer member,”

- to measure a “time lag dt2 as a difference between a time Tc when said mark detection signal is detected and a time Td when said standard angle detection signal is detected during ... [the] second [round of] rotation of said endless intermediate transfer member,” and
- to “correct said phase based on said time lag dt2 and said time lag dt1” previously stored.

However, Takeyama ‘566 teaches “storing” (timing memory 36, FIG. 13, column 22 lines 15-30) a “time lag dt1 as a difference between a time Ta when ... [the] mark detection signal is detected and a time Tb when said standard angle detection signal is detected during ... [the] first [round of] rotation of said endless intermediate transfer member” (time difference between signal M1 and first LSync signal after M1; obvious to one of ordinary skill to use LSync signal as standard angle detection signal, FIGs. 5 and 10, column 13 line 61 to column 14 line 6 and column 17 lines 53-59),

- to measure a “time lag dt2 as a difference between a time Tc when said mark detection signal is detected and a time Td when said standard angle detection signal is detected during ... [the] second [round of] rotation of said endless intermediate transfer member” (time difference between signal M2 and first LSync signal after M2; obvious to one of ordinary skill to use one mark instead of two, FIGs. 5 and 10, column 13 line 61 to column 14 line 6 and column 17 lines 53-59), and
- to “correct said phase based on said time lag dt2 and said time lag dt1” (timing for starting exposure to first and second image formation sections 10 and 20 determined by synchronizing signal LSync, FIGs. 5 and 6, column 13 line 61 to column 14 line 20).

Regarding **claim 21**, Takeyama ‘178, Takeuchi, Saitoh et al. and Takeyama ‘566 teach all the limitations of this claim similar to the limitations discussed in claim 2 above.

Allowable Subject Matter

8. **Claims 3-19 and 22-38** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and if amended to overcome the informalities specified above. The following are reasons for the indication of allowable subject matter:

Regarding **claims 3 and 22**, no prior art is discovered to show or suggest initiating optical image writing based on a beam detection signal detected after a time T_c determined as a time elapsed by a base correction time t_1 from a time T_a and correcting phase, during a period between a time T_c and a time including the time T_c and the base correction time t_1 , based on a time lag dt_2 and a time lag dt_1 . Therefore, in light of the disclosed prior art, it would not have been obvious for one of ordinary skill in the art at the time the invention was made to have initiated optical image writing and corrected the phase based on the specified times.

Regarding **claims 4-19 and 23-38**, these claims are deemed allowable because they are dependent on base claims 3 and 22 containing allowable subject matters as discussed above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENDRICK X. LIU whose telephone number is (571)270-3798. The examiner can normally be reached on Monday-Friday 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long T. Nguyen can be reached on (571) 272-1753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KxL

/Taghi T. Arani/
Supervisory Patent Examiner, Art Unit 4193
4/30/2008